

## CLAIMS:

1. Antenna module for use in hand-held communication devices,  
comprising - a printed circuit board (1), - a first antenna (2) having a resonance  
frequency in a first frequency range, - a second antenna (3) having a resonance  
frequency in a second frequency range, whereby - each antenna comprises a dielectric  
5 substrate (5) with a first and a second metallic resonator structure (6, 7) printed on its  
surface, - the first resonator structure (6) is connected to a feed line (4), and  
- the second resonator structure (7), electrically isolated from and adjacent to the first  
resonator structure (6), is connected to the printed circuit board (1) for grounding it.
- 10 2. Antenna module according to claim 1, characterized by means for  
fastening the antennae (2, 3) to a cover of the antennae.
3. Antenna module according to claim 1, characterized by a plane substrate  
(5) being substantially rectangular.
- 15 4. Antenna module according to claim 3, characterized in that the antennae  
(2, 3) are vertically aligned with respect to the printed circuit board (1).
5. Antenna module according to claim 4, characterized in that the antennae  
20 (2, 3) are located at the top and/or the side of the printed circuit board (1).
6. Antenna module according to claim 1, characterized in that the first  
resonance frequency is substantially in a frequency range of 824 MHz to 960 MHz.
- 25 7. Antenna module according to claim 1, characterized in that the second  
harmonic of the first antenna is substantially in a frequency range of 1710 MHz to 2200

MHz.

8. Antenna module according to claim 1, characterized in that the second resonance frequency is substantially in a frequency range of 1880 MHz to 2200 MHz.
- 5 9. Antenna module according to claim 1, characterized in that the printed circuit board (1) includes a radio frequency generator (9) whose signal is directed to the antennae via a power control unit (10).
- 10 10. Antenna module according to claim 1, characterized in that at least one feed line (4, 4') of the antennae includes a phase changer (11, 11').
11. Antenna module according to claim 1, characterized in that the printed circuit board (1) includes a unit (12) capable to compare the strength of the signals  
15 received by the antennae.
12. Method to operate a telecommunication device with two antennae, in which the signal of a radio frequency generator (9) is transferred via a power control unit (10) to both antennae (2, 3) at the same time.
- 20 13. Method according to claim 12, characterized in that the strength of signals received by the antennae (2, 3) is compared, and that the power control unit (10) distributes the radio frequency power between the antennae depending on the signal strength.
- 25 14. Method according to claim 13, characterized in that the antenna with the higher signal strength is chosen to emit radiation.
15. Method according to claim 12, characterized in that the phase of the  
30 signal received by at least one of the antennae is actively controlled.

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16. Method according to claim 12 used for operation of an antenna module according to any of the claims 1 to 11.